

### **REMARKS**

Claims 17-36 are pending, with claims 33-36 withdrawn from consideration (despite Applicants' traversal), and claims 17-32 under current examination. By this Amendment, Applicants have amended claim 17. Support for the amendment to claim 17 may be found in the specification at, for example, ¶¶ [044]-[045], and Fig. 3.

Applicants respectfully traverse the rejections made in the Office Action, which:

- (a) made final the Restriction Requirement previously traversed;
- (b) rejected claims 17, 18, 29, and 30 under 35 U.S.C. § 103(a) as being unpatentable over WO90/12314 as cited to USPTO translation PTO/96-4882 ("Urban");
- (c) rejected claims 19, 22-25, and 31 under 35 U.S.C. § 103(a) as being unpatentable over Urban in view of U.S. Patent No. 5,810,725 ("Sugihara");
- (d) rejected claims 20 and 21 under 35 U.S.C. § 103(a) as being unpatentable over Urban and Sugihara in view of U.S. Patent No. 4,874,500 ("Madou");
- (e) rejected claims 26 and 27 under 35 U.S.C. § 103(a) as being unpatentable over Urban in view of an article by Madore et al., entitled "Environmental Sensing Potential with Arrays of Boron-Doped Diamond Microdisk Electrodes," 4<sup>th</sup> International Symposium on New Materials for Electrochemical Systems, July 9-13, 2001, pp. 23-25 ("Madore");
- (f) rejected claim 28 under 35 U.S.C. § 103(a) as being unpatentable over Sugihara in view of Madore; and
- (g) rejected claim 32 under 35 U.S.C. § 103(a) as being unpatentable over Madou as evidenced by U.S. Patent No. 4,062,750 ("Butler").

#### **Regarding the Restriction Requirement:**

Applicants maintain their traversal of the Restriction Requirement, despite their election to prosecute Group I, claims 17-32, characterized by the Examiner as directed to an electrode system. Specifically, Applicants maintain that the Examiner has failed to establish that the

search and examination of all the claims cannot be made without serious burden (*see, e.g.*, M.P.E.P. §§ 803, 806, and 808). Accordingly, Applicants reserve the right to Petition the finality of the Restriction Requirement at a later date.

**Rejection of Claims 17, 18, 29, and 30 under 35 U.S.C. § 103(a):**

Applicants respectfully request reconsideration and withdrawal of the rejection of claims 17, 18, 29, and 30 under 35 U.S.C. § 103(a) as being unpatentable over Urban.

The Office Action has not properly resolved the *Graham* factual inquiries, the proper resolution of which is the requirement for establishing a framework for an objective obviousness analysis. *See* M.P.E.P. § 2141(II), citing to *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), as reiterated by the U.S. Supreme Court in *KSR International Co. v. Teleflex Inc.*, 550 U.S. 398, 82 USPQ2d 1385 (2007). In particular, the Office Action has neither properly determined the scope and content of the prior art, nor properly ascertained the differences between the claimed invention and the prior art, at least because the Office Action has not properly interpreted the prior art by considering *both* the invention *and* the prior art *as a whole*. *See* M.P.E.P. § 2141(II)(B).

Specifically, Urban, taken either alone in this particular rejection, or in any combination with the separately asserted references in the remaining rejections, does not disclose or suggest at least Applicants' claimed "electrode system for an electrochemical cell" that comprises, among other things, "a substrate formed of an electrically conducting material and pierced on at least one surface by a regular array of cavities, the regular array of cavities having a bottom in the substrate," as recited in independent claim 17 (emphasis added).

As recited in claim 17, the cavities of Applicants' electrode system for an electrochemical cell are pierced on at least one upper surface of the substrate, and the cavities have a bottom in

the substrate. An exemplary embodiment of this is shown, for example, in Fig. 3 of Applicants' application. Further, as discussed in Applicants' specification at, for example, ¶¶ [044]-[045], the cavities do not traverse the entire substrate, at least because in one example the substrate has a thickness of 0.5 mm and the cavities have a depth of 2  $\mu$ m to 20  $\mu$ m. Thus, the bottom of the claimed cavities is part of the substrate itself.

In contrast, Urban discloses an electrode system comprising a substrate (5), which is made of an inert material. Urban's microelectrode (1) is deposited on substrate (5), in the cavity formed by successive layers constituting other electrodes (2, 3) and insulating layer (4). See Urban, Fig. 1, and English translation at p. 13, l. 18 to p. 14, l. 2.

As correctly recognized on page 5 of the Office Action, "during patent examination, the pending claims must be 'given their broadest reasonable interpretation consistent with the specification.' [And, during] examination, the claims must be interpreted as broadly as their terms reasonably allow." Office Action, p. 5, quoting *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005), M.P.E.P. § 2111, and *In re American Academy of Science Tech. Center*, 367 F.3d 1359, 1369 (Fed. Cir. 2004). The Office Action, however, does not properly apply this logic to the claims under examination.

The Office Action asserts that "the term 'substrate' is claimed as an electrically conducting material and numeral 2 in figure 10 of Urban et al. is an electrically conducting material." Office Action, p. 5. This allegation, that Urban's electrode (2) is a substrate similar to the claimed substrate, is incorrect. One of ordinary skill in the art would understand that a substrate is the primary material on which other layers or materials are deposited or grown. Therefore, one of ordinary skill in the art would not associate Urban's electrode (2) with the claimed substrate. Urban's electrode (2) is not a substrate, and it would be an unreasonably

broad interpretation of the claimed “substrate” to make this allegation with respect to Urban’s electrode (2). It is clear from Urban, as consistently shown throughout its drawings, that its substrate is designated by numeral (5), and that other layers (*e.g.*, electrodes (1, 2, 3)) are deposited onto substrate (5). Therefore, Urban’s electrode (2) cannot be a substrate, and it does not teach or suggest the claimed “substrate.”

Moreover, the claimed “electrode[s]” should be chosen from materials, such as precious metals (*e.g.*, titanium, platinum, or gold), in order to be later etched or otherwise reacted. *See, e.g.*, Applicants’ specification at, for example, ¶¶ [043] and [063]. Whereas, differently, the claimed substrate may be made of silicon rendered conducting by doping. *See, e.g.*, Applicants’ specification at, for example, ¶ [042]. Therefore, for this additional reason, Urban’s electrode (2) cannot be a substrate, and it does not teach or suggest the claimed “substrate.”

Additionally, even assuming (incorrectly) that one of ordinary skill in the art would interpret Urban’s electrode (2) as a substrate, electrode (2) is totally pierced in such a way that the “cavity” in electrode (2) has no bottom. *See Urban*, Fig. 10. Therefore, Urban’s microelectrode (1) is deposited on inert substrate (5). Otherwise, apertures would have to be made in the substrate for the contacts to the electrodes, and, the result would have been the same if one or more “cavities,” as disclosed in Urban, have been formed. *See, e.g.*, Applicants’ specification at, for example, ¶ [011]. Moreover, Urban neither discloses nor suggests the claimed substrate “pierced on at least one surface by a regular array of cavities, the regular array of cavities having a bottom in the substrate,” as recited in claim 17. That is, Urban does not disclose or suggest that only the upper face of the substrate is pierced in such a way that the cavities have a bottom constituted by the substrate. Therefore, the microelectrode is deposited on the electrically conducting substrate.

In contrast, the claimed electrode system for an electrochemical cell has the advantage of interconnecting the microelectrodes in parallel via their rear face, this having the effect of amplifying the output signal. This is easier and less expensive since the cavities are made directly in the substrate. The cavities are not obtained by successive layers. *See, e.g.*, Applicants' specification at, for example, ¶ 064].

For at least the foregoing reasons, the Office Action has neither properly determined the scope and content of the prior art, nor properly ascertained the differences between the claimed invention and the prior art. Independent claim 17 is not obvious over Urban, whether taken alone in this particular rejection, or in any combination with the separately asserted references in the remaining rejections, and should therefore be allowed. Dependent claims 18, 29, and 30 should also be allowed at least by virtue of their respective dependence from base claim 17, and because they recite additional features not taught or suggested by the cited references. Accordingly, Applicants request the withdrawal of the 35 U.S.C. § 103(a) rejection.

**Remaining Rejections of Claims 19-28, 31, and 32 under 35 U.S.C. § 103(a):**

Applicants respectfully request reconsideration and withdrawal of the remaining rejections of dependent claims 19-28, 31, and 32 under 35 U.S.C. § 103(a) being unpatentable over one or more of Urban, Sugihara, Madou, Madore, and Butler.

In contrast to the assertions in the Office Action at pp. 6-11, the cited references, taken alone or in any combination, do not teach or suggest at least Applicants' claimed "electrode system for an electrochemical cell" that comprises, among other things, "a substrate formed of an electrically conducting material and pierced on at least one surface by a regular array of cavities, the regular array of cavities having a bottom in the substrate," as recited in independent claim 17 (emphasis added).

Regarding Urban, the deficiencies of this reference are outlined above. Regarding Butler, Sugihara, and Madore, these references also fail to teach or suggest all of the features of Applicants' claims for at least the reasons presented in the Response filed on September 22, 2009.

Moreover, newly-applied Madou does not overcome the deficiencies of Urban or the other cited references. Madou teaches a microelectrochemical electrode structure 10 including a monolithic substrate 12. *See* Madou, col. 4, ll. 24-40. According to Madou, "[i]t is important that the substrate 12 be monolithic[,] i.e., a unitary structure formed of a single material, as this allows particularly easy construction and eliminates or greatly reduces problems of prior art devices." Madou, col. 4, ll. 44-47. This teaches away from, and is inconsistent with, the Examiner's interpretation of Urban's structure, which adopts electrode (2) as a substrate, thereby rendering Urban's structure of layers (2, 3, 4) as an alleged substrate, at least because such a structure is not a monolithic, unitary structure.

Madou also teaches away from Sugihara's "desirable" "transparent substrate" material, such as glasses and inorganic materials. *See, e.g.,* Sugihara, col. 5, ll. 39-48. For example, Madou teaches that it is "particularly advantageous to make the substrate 12 out of a semiconductor material such as silicon, silicon carbide, gallium arsenide, or the like." Madou, col. 4, ll. 30-32.

Thus, Urban, Sugihara, Madou, Madore, and Butler do not teach or suggest each and every feature of independent claim 17, since none of the references, whether taken alone or in any combination, discloses or suggests at least "a substrate formed of an electrically conducting material and pierced on at least one surface by a regular array of cavities, the regular array of cavities having a bottom in the substrate...," as recited in claim 17 (emphasis added). Claim 17 is therefore patentable over the references of record and should be allowed. Dependent claims

19-28, 31, and 32 should also be allowed at least by virtue of their respective dependence from base claim 17, and because they recite additional features not taught or suggested by the cited references. Accordingly, Applicants request the withdrawal of the remaining 35 U.S.C. § 103(a) rejections.

**Conclusion:**

Applicants respectfully request reconsideration and withdrawal of the rejections. Claims 17-32 are in condition for allowance, and Applicants request a favorable action.

The Office Action contains statements characterizing the related art and the claims. Regardless of whether any such statements are specifically identified herein, Applicants decline to automatically subscribe to any statements in the Office Action.

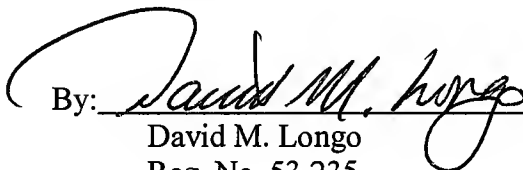
If there are any remaining issues or misunderstandings, Applicants request the Examiner telephone the undersigned representative to discuss them.

Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916.

Respectfully submitted,

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